

**STRUCTURES OF AND METHODS OF FABRICATING
TRENCH-GATED MIS DEVICES**

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ABSTRACT

10 In a trench-gated MIS device contact is made to the gate within the trench, thereby eliminating the need to have the gate material, typically polysilicon, extend outside of the trench. This avoids the problem of stress at the upper corners of the trench. Contact between the gate metal and the polysilicon is normally made in a gate metal region that is outside the active region of the device. Various
15 configurations for making the contact between the gate metal and the polysilicon are described, including embodiments wherein the trench is widened in the area of contact. Since the polysilicon is etched back below the top surface of the silicon throughout the device, there is normally no need for a polysilicon mask, thereby saving fabrication costs.

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